

WHAT IS CLAIMED IS:

1. An antenna structure, comprising:

2       an antenna trace formed on a substrate proximate a ground  
3       plane of said substrate; and

4       an insulation region extending through said substrate and  
5       located between said antenna trace and said ground plane.

2. The antenna structure recited in Claim 1 wherein said  
2       insulation region includes a plurality of insulation regions.

3. The antenna structure recited in Claim 2 wherein each of  
2       said insulation regions are separated by a portion of said  
3       substrate.

4. The antenna structure recited in Claim 1 wherein said  
2       insulation region is an opening that extends through said substrate  
3       and an insulator of said insulation region is air.

5. The antenna structure recited in Claim 1 wherein said  
2       insulation region includes an insulation material selected from a  
3       group consisting of:

4           ABS plastic;  
5           ceramic; and

Teflon.

6. The antenna structure recited in Claim 1 wherein said  
2 antenna trace includes antenna traces located on opposing surfaces  
3 of said substrate.

7. The antenna structure recited in Claim 1 wherein said  
2 antenna traces are interconnected by vias extending through said  
3 substrate.

8. A method of manufacturing an antenna structure,  
2 comprising:  
3 forming an antenna trace on a substrate proximate a ground  
4 plane of said substrate; and  
5 creating an insulation region extending through said substrate  
6 and located between said antenna trace and said ground plane.

9. The method recited in Claim 8 wherein said creating  
2 includes creating a plurality of insulation regions.

10. The method recited in Claim 8 wherein said creating a  
2 plurality of insulation regions includes creating a plurality of  
3 insulation regions separated by a portion of said substrate.

11. The method recited in Claim 8 wherein said creating an  
2 insulation region includes creating an opening that extends through  
3 said substrate and wherein an insulator of said insulation region  
4 is air.

12. The method recited in Claim 11 wherein said creating an  
2 opening includes drilling a hole in said substrate.

13. The method recited in Claim 8 wherein said creating  
2 includes creating an insulation region having an insulation  
3 material selected from a group consisting of:

4           ABS plastic;  
5           ceramic; and  
6           Teflon.

14. The method recited in Claim 8 wherein said forming  
2 includes forming antenna traces located on opposing surfaces of  
3 said substrate interconnected by vias extending through said  
4 substrate.

15. A printed circuit board (PCB), comprising:

2       a substrate having a ground plane and conductive traces formed

3       thereon; and

4       an antenna structure, including:

5            an antenna trace formed on said substrate proximate said

6       ground plane; and

7            an insulation region extending through said substrate and

8       located between said antenna trace and said ground plane.

16. The PCB recited in Claim 15 further including electrical

2 components mounted on said substrate and interconnected between at

3 least one of said conductive traces and said ground plane to form

4 an operative circuit.

17. The PCB recited in Claim 15 wherein said insulation

2 region includes a plurality of insulation regions separated by a

3 portion of said substrate.

18. The PCB recited in Claim 15 wherein said insulation

2 region is an opening that extends through said substrate and an

3 insulator of said insulation region is air.

19. The PCB recited in Claim 15 wherein said insulation

2 region includes an insulation material selected from a group

3 consisting of:

4           ABS plastic;  
5           ceramic; and  
6           Teflon.

20. The PCB recited in Claim 15 wherein said antenna trace  
2     includes antenna traces located on opposing surfaces of said  
3     substrate interconnected by vias extending through said substrate.